



Department of Pesticide Regulation

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MEMORANDUM



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TO: Joseph Frank, Senior Toxicologist
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FROM: Sally Powell, Senior Environmental Research Scientist [original signed by S. Powell]
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DATE: April 9, 2002

SUBJECT: REVISED EXPOSURES TO METHYL BROMIDE BASED ON THE FINAL REPORT ON THE 2001 MONITORING IN OXNARD/CAMARILLO AND SANTA MARIA BY THE ALLIANCE OF THE METHYL BROMIDE INDUSTRY

Exposures to methyl bromide in Oxnard/Camarillo and Santa Maria, based on the draft report by the Alliance of the Methyl Bromide Industry (AMBI, 2002a), were reported previously (Powell, 2002). In the final AMBI report (AMBI, 2002b), minor corrections to three data points from Oxnard/ Camarillo have been made. There were no changes to the Santa Maria data. This memo gives revised exposures based on the corrected data. All exposure calculations were as described in Powell (2002). Exposures are expressed as concentrations of methyl bromide in air for 24-hour, 1-week and 8-week averaging periods (Table 1). Daily concentrations and intermediate calculations are shown in Tables 2 and 3.

Table 1. Methyl bromide concentrations (ppbv) in Oxnard/Camarillo and Santa Maria, 2001, based on monitoring by the Alliance of the Methyl Bromide Industry.

Site ^a	n days	Daily		1-week		8-week Mean of weekly means
		Maximum 24-hr	95% tolerance limit	Maximum weekly ^b mean	95% tolerance limit	
Oxnard/Camarillo (15 Aug – 10 Oct, 2001)						
PVW	31 ^c	3.17	2.56 ^d	2.01	2.59	0.56
UWC	19	4.35	8.77	2.08	3.48	0.82
SHA	29	2.94 ^e	2.43 ^f	2.30 ^g	2.55 ^h	0.50 ⁱ
ABD	21	0.44 ^j	0.44	0.44 ^j	0.58	0.18
Santa Maria (23 Aug – 9 Oct, 2001)						
BLO	31	4.55	4.85	1.89	2.25	0.73
AGCCRS	28	1.16	1.28	0.85	1.00	0.28
EDW	30	11.15	10.57	6.49	7.10	1.32
PNT	24	2.69	4.62	1.75	2.26	0.93

- a* Monitoring sites described in AMBI (2002b).
- b* Each weekly mean is the arithmetic mean of the 24-hr samples (*n* ranged 1 - 5) in a calendar week.
- c* Changed from 30 days in draft version.
- d* Changed from 2.68 ppbv in draft version.
- e* Changed from 3.38 ppbv in draft version.
- f* Changed from 2.41 ppbv in draft version.
- g* Changed from 2.47 ppbv in draft version.
- h* Changed from 2.73 ppbv in draft version.
- i* Changed from 0.51 ppbv in draft version.
- j* Measured in a week with only one 24-hr sample.

References

- AMBI. 2002a. Draft preliminary report: Methyl bromide ambient air monitoring in Oxnard/Camarillo and Santa Maria, August-October, 2001. Draft dated Feb. 15. Sacramento, CA: Alliance of the Methyl Bromide Industry.
- AMBI. 2002b. Final report: Methyl bromide ambient air monitoring in Oxnard/Camarillo and Santa Maria, August-October, 2001. Report dated April 4. Sacramento, CA: Alliance of the Methyl Bromide Industry.
- Powell, S. 2002. Exposures to methyl bromide based on the report on the 2001 monitoring in Oxnard/Camarillo and Santa Maria by the Alliance of the Methyl Bromide Industry. HSM-02007. Sacramento, CA: Worker Health and Safety Branch, Department of Pesticide Regulation, California Environmental Protection Agency.

cc: Tom Thongsinthusak
Lori Lim
Randy Segawa

Table 2. Daily concentrations and intermediate calculations for Oxnard/Camarillo.

DATE	Week	PVW	UWC	SHA	ABD	ppbv	DATE	Week	PVW	UWC	SHA	ABD	ln(ppbv)
15-Aug-01	1	1.82	2.58	0.69			15-Aug-01	1	0.60	0.95	-0.37		
16-Aug-01	1	1.05	1.85	0.17			16-Aug-01	1	0.05	0.61	-1.77		
17-Aug-01	1	3.17	1.80	0.18			17-Aug-01	1	1.15	0.59	-1.73		
18-Aug-01	1						18-Aug-01	1					
19-Aug-01	1						19-Aug-01	1					
	1 Average	2.01	2.08	0.35									
20-Aug-01	2						20-Aug-01	2					
21-Aug-01	2	0.50	1.53				21-Aug-01	2	-0.70	0.42			
22-Aug-01	2	1.91	0.45				22-Aug-01	2	0.65	-0.79			
23-Aug-01	2	2.49	4.35	2.94			23-Aug-01	2	0.91	1.47	1.08		
24-Aug-01	2		2.01	2.86			24-Aug-01	2		0.70	1.05		
25-Aug-01	2	0.81	0.25	1.09			25-Aug-01	2	-0.21	-1.40	0.09		
26-Aug-01	2						26-Aug-01	2					
	2 Average	1.43	1.72	2.30									
27-Aug-01	3						27-Aug-01	3					
28-Aug-01	3	0.12	0.21	1.09			28-Aug-01	3	-2.11	-1.54	0.08		
29-Aug-01	3	0.15	0.10	0.07			29-Aug-01	3	-1.90	-2.29	-2.70		
30-Aug-01	3	0.28	0.35	0.56	0.44		30-Aug-01	3	-1.29	-1.05	-0.58	-0.83	
31-Aug-01	3	0.15	0.18				31-Aug-01	3	-1.87	-1.74			
1-Sep-01	3						1-Sep-01	3					
2-Sep-01	3						2-Sep-01	3					
	3 Average	0.18	0.21	0.57	0.436								
3-Sep-01	4						3-Sep-01	4					
4-Sep-01	4						4-Sep-01	4					
5-Sep-01	4						5-Sep-01	4					
6-Sep-01	4	0.20		0.04	0.05		6-Sep-01	4	-1.61		-3.27	-2.96	
7-Sep-01	4	0.10		0.03	0.13		7-Sep-01	4	-2.30		-3.41	-2.03	
8-Sep-01	4	0.07		0.05	0.13		8-Sep-01	4	-2.67		-3.02	-2.08	
9-Sep-01	4	0.16		0.23	0.39		9-Sep-01	4	-1.85		-1.47	-0.93	
	4 Average	0.13		0.09	0.18								
10-Sep-01	5						10-Sep-01	5					
11-Sep-01	5						11-Sep-01	5					
12-Sep-01	5						12-Sep-01	5					
13-Sep-01	5	0.17		0.38	0.07		13-Sep-01	5	-1.80		-0.98	-2.67	
14-Sep-01	5	0.15		0.07	0.10		14-Sep-01	5	-1.93		-2.69	-2.27	
15-Sep-01	5	0.20		0.13	0.15		15-Sep-01	5	-1.61		-2.04	-1.92	
16-Sep-01	5	0.29		0.11	0.11		16-Sep-01	5	-1.25		-2.17	-2.17	
	5 Average	0.20		0.17	0.11								
17-Sep-01	6	0.35		0.13	0.14		17-Sep-01	6	-1.05		-2.02	-2.00	
18-Sep-01	6						18-Sep-01	6					
19-Sep-01	6	0.18	0.18	0.10	0.10		19-Sep-01	6	-1.71	-1.71	-2.32	-2.28	
20-Sep-01	6	0.59	0.30	0.58	0.11		20-Sep-01	6	-0.53	-1.19	-0.54	-2.21	
21-Sep-01	6						21-Sep-01	6					
22-Sep-01	6						22-Sep-01	6					
23-Sep-01	6						23-Sep-01	6					
	6 Average	0.37	0.24	0.27	0.116								

continued

Table 2. Continued.

ppbv					
DATE	Week	PVW	UWC	SHA	ABD
24-Sep-01	7				
25-Sep-01	7				
26-Sep-01	7	0.17	0.60	0.45	0.25
27-Sep-01	7	0.08		0.09	0.12
28-Sep-01	7	0.08		0.10	0.15
29-Sep-01	7	0.11		0.19	0.19
30-Sep-01	7	0.15		0.07	0.06
7 Average		0.12	0.60	0.18	0.16
1-Oct-01	8				
2-Oct-01	8				
3-Oct-01	8				
4-Oct-01	8				
5-Oct-01	8				
6-Oct-01	8				
8 Average					
7-Oct-01	9	0.06	0.07	0.10	0.04
8-Oct-01	9	0.05	0.05	0.05	0.06
9-Oct-01	9	0.09	0.07	0.07	0.10
10-Oct-01	9	0.10	0.07	0.11	0.11
9 Average		0.07	0.06	0.08	0.08

ln(ppbv)						
DATE	Week	PVW	UWC	SHA	ABD	
24-Sep-01	7					
25-Sep-01	7					
Wed	26-Sep-01	7	-1.79	-0.52	-0.81	-1.37
Thur	27-Sep-01	7	-2.48		-2.38	-2.10
Fri	28-Sep-01	7	-2.48		-2.32	-1.88
Sat	29-Sep-01	7	-2.20		-1.67	-1.64
Sun	30-Sep-01	7	-1.93		-2.65	-2.87
	1-Oct-01	8				
	2-Oct-01	8				
	3-Oct-01	8				
	4-Oct-01	8				
	5-Oct-01	8				
	6-Oct-01	8				
<i>Sun</i>	7-Oct-01	9	-2.80	-2.73	-2.34	-3.17
Mon	8-Oct-01	9	-3.04	-2.91	-3.02	-2.75
Tue	9-Oct-01	9	-2.44	-2.73	-2.73	-2.27
Wed	10-Oct-01	9	-2.29	-2.70	-2.24	-2.20

Mean of week means	0.564	0.817	0.500	0.179
SD of week means	0.736	0.862	0.743	0.131
Max of week means	2.014	2.077	2.297	0.436
n weeks	8	6	8	6
95th %ile of week means	1.96	2.55	1.91	0.44
90% tol limit on 95th %ile	2.59	3.48	2.55	0.58
Max of days	3.17	4.35	2.94	0.44

Overall mean of days	-1.43	-0.98	-1.69	-2.12
Overall SD of days	1.14	1.41	1.23	0.60
n days	31	19	29	21
95th %ile of days	1.65	4.37	1.51	0.34
90% tol limit on 95th	2.56	8.77	2.43	0.44

Table 3. Daily concentrations and intermediate calculations for Santa Maria.

DATE	Week	BLO	AGC	EDW	PNT
23-Aug-01	2	0.04	0.03	0.02	
24-Aug-01	2	0.03	0.13	1.02	
25-Aug-01	2	0.68	0.11	0.69	
26-Aug-01	2	3.46	0.13	1.33	0.34
	2 Average	1.05	0.10	0.76	0.34
27-Aug-01	3	2.09	0.14	0.98	0.68
28-Aug-01	3	0.19	0.06	0.44	0.10
29-Aug-01	3	0.34	0.02	0.32	1.29
30-Aug-01	3	0.30	0.06	0.58	1.68
31-Aug-01	3				
1-Sep-01	3				
2-Sep-01	3				
	3 Average	0.73	0.07	0.58	0.94
3-Sep-01	4				
4-Sep-01	4	0.07	0.05	0.30	0.22
5-Sep-01	4	0.17	0.05	0.09	0.43
6-Sep-01	4	0.21	0.13	0.59	0.51
7-Sep-01	4	0.11		0.20	
8-Sep-01	4				
9-Sep-01	4				
	4 Average	0.14	0.07517	0.30	0.39
10-Sep-01	5				
11-Sep-01	5	1.47	0.15	1.30	1.81
12-Sep-01	5		0.21	0.68	0.78
13-Sep-01	5	0.40	0.21	0.64	0.59
14-Sep-01	5	0.51	0.20	1.01	1.07
15-Sep-01	5				
16-Sep-01	5	0.78			
	5 Average	0.79	0.19	0.91	1.06
17-Sep-01	6	0.31	0.14	0.54	0.57
18-Sep-01	6	0.33	0.37	0.83	
19-Sep-01	6	0.42	0.30	0.49	
20-Sep-01	6				
21-Sep-01	6				
22-Sep-01	6				
23-Sep-01	6				
	6 Average	0.35	0.27	0.62	0.57

DATE	Week	BLO	AGC	EDW	PNT	
Thur	23-Aug-01	2	-3.12	-3.47	-4.07	
Fri	24-Aug-01	2	-3.44	-2.01	0.02	
Sat	25-Aug-01	2	-0.39	-2.23	-0.38	
Sun	26-Aug-01	2	1.24	-2.02	0.29	-1.08
Mon	27-Aug-01	3	0.74	-2.00	-0.02	-0.38
Tue	28-Aug-01	3	-1.67	-2.88	-0.81	-2.28
Wed	29-Aug-01	3	-1.08	-3.73	-1.14	0.25
Thur	30-Aug-01	3	-1.19	-2.78	-0.54	0.52
	31-Aug-01	3				
	1-Sep-01	3				
	2-Sep-01	3				
	3-Sep-01	4				
Tue	4-Sep-01	4	-2.70	-3.10	-1.22	-1.51
Wed	5-Sep-01	4	-1.80	-3.08	-2.42	-0.85
Thur	6-Sep-01	4	-1.55	-2.01	-0.52	-0.67
Fri	7-Sep-01	4	-2.19		-1.59	
	8-Sep-01	4				
	9-Sep-01	4				
	10-Sep-01	5				
Tue	11-Sep-01	5	0.38	-1.90	0.26	0.59
Wed	12-Sep-01	5		-1.57	-0.39	-0.25
Thur	13-Sep-01	5	-0.91	-1.57	-0.44	-0.54
Fri	14-Sep-01	5	-0.67	-1.63	0.01	0.07
	15-Sep-01	5				
	16-Sep-01	5	-0.25			
Mon	17-Sep-01	6	-1.18	-1.94	-0.62	-0.57
Tue	18-Sep-01	6	-1.12	-1.01	-0.19	
Wed	19-Sep-01	6	-0.87	-1.22	-0.72	
	20-Sep-01	6				
	21-Sep-01	6				
	22-Sep-01	6				
	23-Sep-01	6				

continued

Table 3. Continued.

ppbv					
DATE	Week	BLO	AGC	EDW	PNT
24-Sep-01	7	2.22	0.20	4.09	1.24
25-Sep-01	7	1.12		7.08	
26-Sep-01	7	0.34	0.42	11.15	0.55
27-Sep-01	7	1.20	0.72	4.05	0.83
28-Sep-01	7				
29-Sep-01	7				
30-Sep-01	7	4.55		6.08	2.69
7 Average		1.89	0.45	6.49	1.33
1-Oct-01	8	0.24	0.90	0.38	1.98
2-Oct-01	8	0.52	1.16	0.68	1.85
3-Oct-01	8	0.24	0.48	0.22	1.43
4-Oct-01	8				
5-Oct-01	8				
8 Average		0.33	0.85	0.42	1.75
6-Oct-01	9	0.58	0.08	0.36	0.82
7-Oct-01	9	0.52	0.21		0.93
8-Oct-01	9	0.21	0.17	0.26	0.21
9-Oct-01	9	1.04	0.39	0.82	2.26
9 Average		0.59	0.21	0.48	1.06

Mean of week means	0.73	0.28	1.32	0.93
SD of week means	0.55	0.26	2.10	0.48
Max of week means	1.89	0.85	6.49	1.75
n weeks	8	8	8	8
95th %ile of week means	1.77	0.77	5.29	1.85
90% tol limit on 95th %ile	2.25	1.00	7.10	2.26
Max of days	4.55	1.16	11.15	2.69

ln(ppbv)						
	DATE	Week	BLO	AGC	EDW	
Mon	24-Sep-01	7	0.80	-1.62	1.41	0.22
Tue	25-Sep-01	7	0.11		1.96	
Wed	26-Sep-01	7	-1.09	-0.87	2.41	-0.60
Thur	27-Sep-01	7	0.18	-0.33	1.40	-0.19
	28-Sep-01	7				
Sun	29-Sep-01	7				
	30-Sep-01	7	1.52		1.81	0.99
Mon	1-Oct-01	8	-1.44	-0.11	-0.98	0.68
Tue	2-Oct-01	8	-0.65	0.15	-0.39	0.62
Wed	3-Oct-01	8	-1.45	-0.74	-1.52	0.36
	4-Oct-01	8				
	5-Oct-01	8				
Sat	6-Oct-01	9	-0.54	-2.58	-1.03	-0.20
Sun	7-Oct-01	9	-0.66	-1.56		-0.07
Mon	8-Oct-01	9	-1.57	-1.79	-1.34	-1.57
Tue	9-Oct-01	9	0.04	-0.95	-0.20	0.82

Overall mean of days	-0.86	-1.80	-0.37	-0.24
Overall SD of days	1.17	0.98	1.31	0.82
n days	31	28	30	24
95th %ile of days	3.10	0.87	6.42	3.24
90% tol limit on 95th	4.85	1.28	10.57	4.62